

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A solder supplying method for forming solder coating on a metal film comprising:

positioning a substrate, having the metal film on a surface, with the surface facing up in a liquid which is heated to be hotter than a melting point of the solder;

~~melting the solder;~~ and

dropping solder fine particles ~~made of melted solder onto~~ toward the substrate so that particles having a predetermined size reach the substrate when the falling speeds of the solder fine particles are within a specific time period, the specific time period being defined to exclude solder fine particles both larger and smaller than the predetermined size in the liquid,

~~wherein a size range of the solder fine particles is within 3 to 15 μ m in diameter.~~

2. (Previously Presented) The solder supplying method according to claim 1, wherein the solder fine particles, which are dropped and come in contact with the metal film or the solder coating, are kept in contact with either one of the metal film or the solder coating for a certain time until solder wetting occurs.

3. (Canceled).

4. (Currently Amended) A solder bump forming method for forming a solder bump on a pad electrode comprising:

positioning a substrate having the pad electrode on a surface with the surface facing up in a liquid which is heated to be hotter than a melting point of the solder;

melting the solder;

supplying solder fine particles made of melted solder into the liquid; and

dropping the solder fine particles ~~onto the substrate,~~ toward the substrate so that particles having a predetermined size reach the substrate when the falling speeds of the solder fine particles are within a specific time period, the specific time period being defined to exclude solder fine particles both larger and smaller than the predetermined size

~~wherein a size range of the solder fine particles is within 3 to 15 μ m in diameter.~~

5. (Currently Amended) The solder bump forming method according to claim 4, wherein the solder fine particles are supplied on the substrate after forming the solder fine particles in advance by ~~formed by breaking the solder with a solder fine particle forming unit in the liquid the solder being melted.~~

6. (Original) The solder bump forming method according to claim 4, wherein flux is contained in the liquid.

7. (Previously Presented) The solder bump forming method according to claim 4, wherein an organic acid is contained in the liquid or the liquid is made of the organic acid, wherein the organic acid has a reduction effect which removes an oxide on a metal surface.

8. (Previously Presented) The solder bump forming method according to claim 4, wherein a diameter of the solder fine particle is smaller than a minimum distance between the pad electrodes.

9. (Withdrawn) The solder bump forming method of claim 1, utilizing a solder bump forming apparatus, said solder bump forming apparatus comprising:

a liquid tank for containing a liquid heated to be hotter than a melting point of the solder;

a substrate holder provided in the liquid tank which holds a substrate having pad electrodes on a surface-with the surface facing up in the liquid; and

a solder fine particle supplier which supplies the solder fine particles made of melted solder into the liquid; and drops the solder fine particles onto the substrate.

10. (Withdrawn) The solder bump forming method according to claim 9, wherein the solder fine particle supplier forms the solder fine particles through breaking melted solder in the liquid.

11. (Withdrawn) The solder bump forming method according to claim 9, wherein:

the liquid tank comprises a first liquid tank for containing the substrate holder and the liquid and a second liquid tank for containing the liquid and the melted solder deposited in the liquid;

upper sections of the first liquid tank and the second liquid tank are connected with each other so that the liquid and the solder fine particles can flow between the first and the second liquid tank; and

the solder fine particle supplier further comprises a grinder for forming the solder fine particles by breaking the melted solder deposited in the bottom of the second liquid tank and supplies the solder fine particles to the first liquid tank from the second liquid tank through the connected portion.

12. (Withdrawn) The solder bump forming method according to claim 9, wherein:

the liquid tank comprises a first liquid tank for containing the substrate holder, the liquid and the melted solder deposited in the liquid, and a second liquid tank for containing the liquid and the melted solder deposited in the liquid;

upper sections and bottom sections of the first liquid tank and the second liquid tank are connected with each other so that the liquid and the solder fine particles can flow between the first and the second liquid tank; and

the solder fine particle supplier further comprises a grinder for forming the solder fine particles by breaking the melted solder deposited in the bottom of the first liquid tank and the second liquid tank, and supplies the solder fine particles to the first liquid tank from the second liquid tank through the upper connected portion.

13. (Withdrawn) The solder bump forming method according to claim 9, wherein flux is contained in the liquid.

14. (Withdrawn) The solder bump forming method according to claim 9, wherein an organic acid or flux is contained in the liquid or the liquid is made of the organic acid, and the organic acid or the flux has a reduction effect which removes an oxide on a metal surface.

15. (Withdrawn) The solder bump forming method according to claim 9, wherein a diameter of the solder fine particle is smaller than a minimum shortest distance between the pad electrodes.

16. (Previously Presented) The solder bump forming method according to claim 9, wherein the solder fine particle supplier further selects the solder fine particles with a specific size range and drops the selected solder fine particles onto the substrate.

17. (Previously Presented) The solder supplying method according to claim 1, wherein the metal film is covered with gold.